SOCIAL SCIENCE

The Training School **Bulletin**

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"For the practicing professions concerned with mental retardation"

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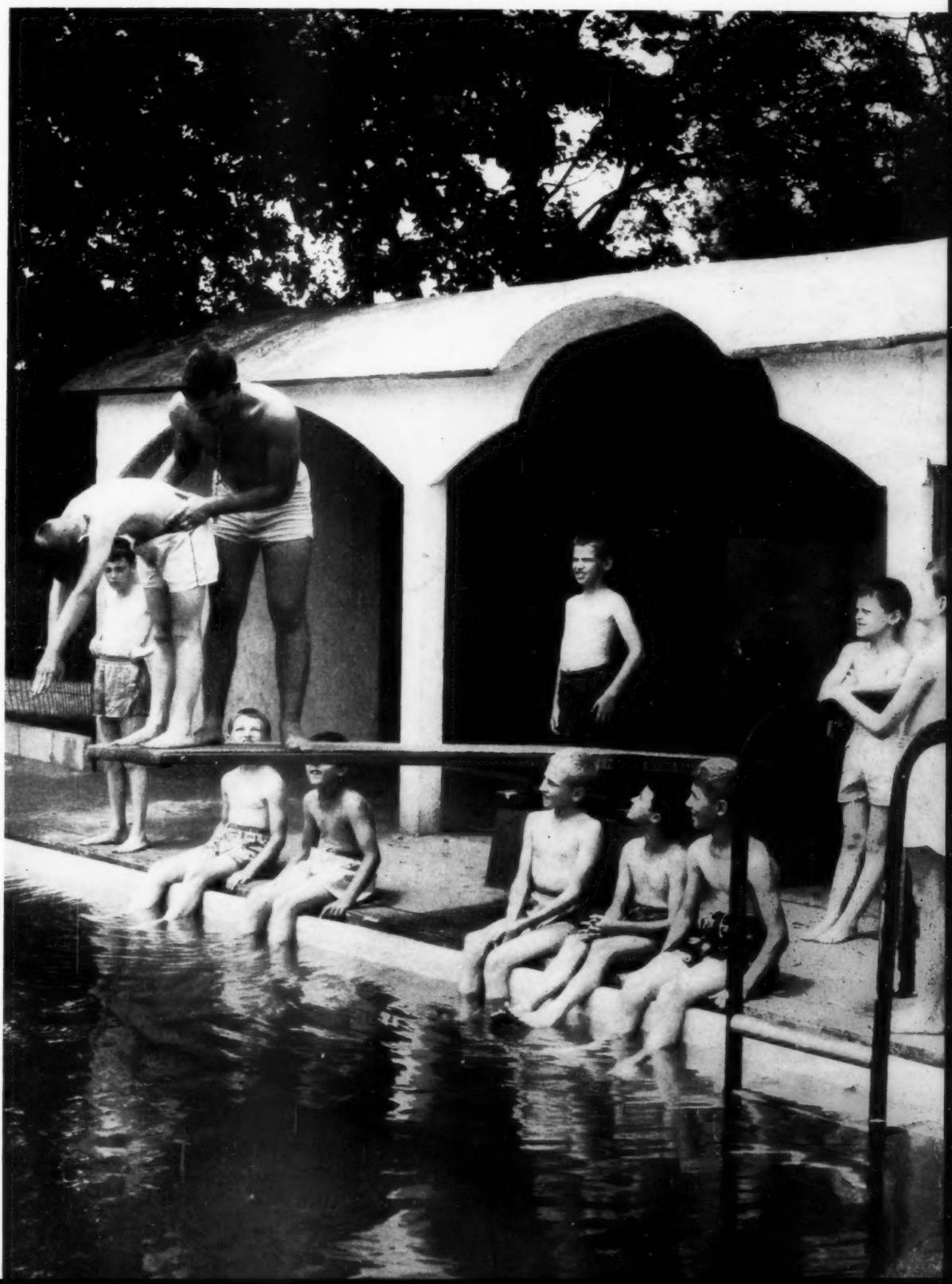

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The Training School BULLETIN

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1. Articles of a technical nature, e. g., reports of research, discussion of problems in the field.
2. Non-technical articles of general interest, e. g., human interest stories of the mentally retarded, restatements of technical material for the layman.
3. Book reviews and news notes.
4. In special instances republication of important articles having limited distribution.

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Servicing the Multiple Handicapped

Whatever the factors that make for mental retardation may be, certainly we are dealing in almost each case with a child who has more than one handicap. We have the deaf and retarded, the emotionally disturbed and retarded, the retarded with seizures, and many more combinations. Too often the specialty centers for the other handicap avoid accepting the child because of his retardation, and those for the mentally retarded hesitate admitting him because of the concomitant difficulty. As a result the child loses opportunities to improve himself under competent treatment and training and the parent is at wit's end to know where to turn for help. State institutions have less chances of turning down a child who is seriously handicapped in either one or two of these areas. Private schools and agencies may be more selective, which, of course, does not answer the problems of many with combined handicaps.

Many of the combinations need specialized equipment and treatment which often are difficult to find nearby. University affiliation is desirable. Staff is not always available for the specific condition. Admission of a child infers availability of a program for him and in that sense the refusal of admission by a private agency can well be a protection to the child and parent.

The Training School at Vineland for almost 70 years has serviced the mentally retarded. It has faced the gamut of problems which confront any private center of its type. To avoid some, it has admitted only those whose primary problem is mental retardation. This made acceptable those whose added handicaps were secondary to a degree that interference with the basic program was minimal.

But increasing awareness of these multiple handicaps in their children, greater publicity, better family incomes, and the like have brought parents to a point of persistent demand that **some** agency produce a program for each child even if the primary issue is not mental retardation. With a long history of seeking answers to difficult questions, The Training School staff has made various attempts to help the child and parent and still pursue the basic interest to which the School has been dedicated.

Problems of the emotionally-disturbed child functioning on a retarded level are many. Demand for help is so great as to cause institutions to leave the field of the retarded to help these other children. Many of these children may be found to be not retarded once the disturbance has been eliminated or at least eased.

However, too much remains to be done in retardation to leave it because of more demanding or perhaps more glamorous work elsewhere. Nevertheless, because of the inability to cure, the cause of retardation remains generally unpopular with both laymen and professional workers in spite of recent publicity. Only a handful of centers are carrying on intensive training for these children. Fewer are doing investigative work necessary to unravel mysteries still facing us in mental retardation. Yet numerically those so afflicted exceed heart, polio, or cancer cases. Continued application in this area of a sufficient number of professional workers could result in one of the greatest contributions ever made to humanity. The Training School hopes to establish a unit for this type child without losing its basic interest in mental retardation in its other units.

In the meantime let us stop talking about the mentally retarded child without mentioning or clarifying concomitant issues. We must be more specific in always naming each child's complete condition. Likewise, laymen facing this condition will more readily understand the needs of their children. Let us try to provide as complete programs as we know how for the various types we can diagnose at present.

A word might be included at this point regarding the variation of professional assurance existent in various workers. The over-confident who know what they recommend is the right thing and the under-confident who need excessive assistance in diagnostic tests and in cooperating staff may present widely different recommendations in any situation. Each center must protect itself and those who come to it for help against these extremes.

W. J.

Criteria for Vocational Training of the Mentally Retarded

A Revised Concept of the Necessary Mental Level

HAROLD A. DELP Ph.D.

Background

Much emphasis in the guidance of the mentally retarded has suggested that each type of occupational activity has a minimum mental level necessary for success. Some studies have attempted to define for different areas of work the success of "mentally retarded" individuals. Some of these have merely catalogued the retarded as a group and then described and listed job areas in which some have been successful. Other research has attempted to describe the levels of those individuals who are considered to be successful. Phrases showing up in materials include 'types of work which can be done by these children', assuming that **these** children have enough similarity to be so described.

Because of the feeling, expressed by several persons in addition to the author, that these children are not sufficiently alike to be so categorized, an informal study was set up to begin an explanation of revised concepts. While nothing astounding was discovered from the data, they do emphasize the necessity to consider many facets of personality in vocational training and placement other than that of 'minimum mental level' for the job.

Many 'studies' in the past have resulted from conferences attended by persons working in the field. While these are necessary to the establishment of needed activity, results obtained merely from such discussions are questionable. Summaries of discussions of persons who have been or who have not been successful may allow generalization but in many cases errors result from such generalizations.

Some studies (4, 6) similar to the present one have labeled jobs with the mental levels of individuals assigned to them and presumed to be successful. On the other hand, some of these studies (1) only consider the cases of those workers who stay on a particular job. Several fallacies seem present in much of the thinking along these lines. First, it is frequently assumed that, out of several persons showing successful performance on a particular job, the minimum mental level present is, ipso facto, the minimum level possible for job success in that particular area. Actually, (1) persons with lower ability possibly may be successful if they have the opportunity to try the job, and (2) probably not **all** persons with any true minimum level of mental ability could be successful.

Second, it is assumed that, if several persons of a given mental level fail a job area, others of that level should not be guided into that area. Again, the factors of job success and failure of so-called mentally normal persons may be the critical ones. It must be remembered that the mentally retarded are, first, human beings. As such problems of interest, frustration, physical condition, etc. are just as apt to be the important ones. Only after all such variations and causes for "normals" are eliminated can we label the success or failure the result of mental retardation.

The Study

PURPOSE:

Because of the confusion of ideas and apparent facts about necessary mental level for vocational or occupational training and placement, a study was planned to analyze subjective and objective data on the relationships of mental level and its components to the various vocational training areas for mentally retarded individuals.

SUBJECTS:

The actual subjects of the tabulation were approximately 200 students of The Training School who were at the time assigned to any of the various vocational training areas. These were all over sixteen years of age.

The Training School at Vineland, New Jersey has long had a vocational training program for its students. Many occupational areas have been added to the school's program primarily to offer such training. The Menantico Colony, one of the first programs of its kind, was developed to give work opportunities to older boys and men who could not return to the community. At the Colony as well as at the main campus farming in all of its aspects, including dairy and pasteur-

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ization, poultry, orchards, small crops as well as field crops under mechanized cultivation, make up a large share of occupational activities. Along with these are most of the building and grounds maintenance areas, food canning, mattress making, kitchen and dining room work at all levels, greenhouse and floriculture, barbering and beauty care, housekeeping and janitorial work, institution store, various levels of office work, and many others.

PROCEDURE:

The study included an analysis of group data from all of the students in vocational training at The Training School, as well as case studies of subjects who showed wide differences between actual mental levels and those levels previously indicated as minimal for certain training areas. The analysis of individuals attempts to explain failures and successes not previously expected.

SUMMARY OF DATA:

It must be obvious at the beginning that many persons who were successful on certain jobs were at or above the mental ability level described elsewhere as being the minimum for that type of job. The majority of cases, therefore, prove nothing in terms of verifying or denying the basic premise of minimum level necessary. It is the exceptions that are desired to explain a philosophy which may be somewhat different and, hence, which may point the way to more statistically oriented studies to develop the complete story. This summary will include cases which seem at point to be exceptions to any statements found in the literature for which other explanations would appear necessary to account for the success or failure.

Case A—IQ 40—dairy which usually is listed as requiring IQ 65-90 (6). This boy does hand milking as well as stripping after use of milking machines. He has strong hands and arms. A great amount of drive is present as well as an interest in the cows. He assists in pasteurization, operating the machine on his own. This does require, however, a red mark on the gauge which he has learned to use as a guide to closing the valve. After being shown 6 to 10 times 'A' can follow a simple routine of his own. Two such routines appear to be his limit for following at any time.

Case B—IQ 40—also dairy. This boy is similar to the first in many of his activities. He strips, does hand milking, and cleans the stable. Operations at these levels are performed very well under moderate supervision, but 'B' becomes extremely upset emotionally if routines are changed such as might happen with a new supervisor on the job.

Case C—IQ 53—dairy cattle. Although no comparison job could be found in the literature, a much higher level was to be expected in feeding cattle. This man feeds the silage, using good judgment on the amounts fed. As animals changed weight he asks supervisor to be allowed to increase or decrease amount of feed. His estimate of needs is usually right, so that the supervisor needs little time to check his work.

Case D—IQ 53—calf barn. No specific comparison. However, this man has full charge of care of the barn, the calves, and cleaning under daily inspection of the supervisor. Habit, attention to details, ability to follow directions, willingness to perform minor duties, as well as interest in the job seem of importance to this man's success.

Case E—IQ 38—farm. 'General farm work' has been listed as IQ 54-60 minimum. 'Harvesting fruit and vegetables' is listed as IQ 60-67. 'E' cuts asparagus, digs strawberry plants, picks strawberries, tomatoes, and other vegetables. The picking at the level needed for canning is excellent although picking for direct table use is a little rough. He occasionally bruises vegetables picked. He does, however, fit a needed level of production which appears to have a lower mental requirement than anticipated. This boy has learned excellent visual discrimination and has developed habits such that only little explanation or demonstration is needed for a new job in this area. Coordination is good.

Case F—IQ 51—farming. This boy drives a tractor for plowing, fertilizing, cultivating, and discing. He has developed good procedures in alignment, in depth and in other factors. Many others with much higher mental levels seem never to learn to his level in lining-up, in keeping even furrows, and the like.

Case G—IQ 49—poultry. No good comparison. This man cleans, grades, and packs eggs with excellent results.

Case H—IQ 37—poultry. This man picks and draws chickens with very good results and with little supervision.

Case J—IQ 31—grounds. 'Mow lawn' is indicated as being at level of IQ 40-47. This man definitely lower does hand lawn mowing with practically no supervision other than being told which area to care for. This includes lawns around family homes and flower gardens as well as broader grass areas. Although he is slow moving and very talkative, work is done as well as that by most individuals hired in a community for this type of job.

Case K—IQ 40—grounds. This man operates a power mower on large grass areas as well as trimming around edges and pulling weeds.

Case L—IQ 55—greenhouse. 'Greenhouse attendant' is said to require IQ 73-85. The man in question is considerably below the expected level but does a good job of planting, transplanting, caring for plants and flowers.

Case M—IQ 72—greenhouse. Another boy does much higher level work including spraying and dusting, sterilizing ground, budding, trimming hedges, etc.

Case N—IQ 38—handle 2-horse team. While listed as requiring IQ 47-54, this man does well in driving, currying, and other activities in the care of the animals.

Case O—IQ 53—plain cooking. (Given as minimum of IQ 60-67). This girl is assistant cook in a cottage of 25 persons and takes over the cooking for many meals. The girl is very dependable and can be expected to put on the table a well-cooked and nicely dished meal. She follows directions very well. She is rather stolid in personality.

Case P—IQ 37—laundry. Operating mangle is given as IQ 40-47. Extractors and washers are considered more difficult. This individual operates and pulls extractors, loads and pulls washers, and feeds and takes off the mangle. Size, strength, and coordination appear to be important factors in this person's success.

Case Q—IQ 26—laundry. Also pulls washers, with help, as well as delivers laundry to cottages. Another, IQ 60, never was able to learn to operate the washers or to do any laundry job well.

Case R—IQ 51—laundry. Pressing is listed as IQ 60-67 with detailed laundry work at IQ 67-73. This man operates a commercial type press as well as finish ironing on shirts and other garments.

The above cases would seem to indicate that, although actual job requirements may differ in various situations, success on the job is possible at mental levels decidedly below those previously supposed to be minimal. On the other hand, **even these levels cannot be assumed to be the necessary minimums per se.** The type of data obtained in the study does not lend itself to this definition. Table I contains added samples of actual duties performed on various job areas with the lowest

TABLE I

Sample Mental Levels (IQ's) Found For Successful Job Performance Among Students At The Training School at Vineland, New Jersey

(These are minimums obtained but are not necessarily minimums needed for success)

Farm	IQ
Picking chickens and turkeys	30
Wheeling grain	30
Husking corn, washing vegetables	38
Picking apples	38
Thinning plants	38
Cleaning automatic water fountains — poultry	42
Feeding mash and grain	42
Setting onions	44
Cutting trees	44
Tractor plowing, etc.	51
Tractor seeding	52
Machine setting plants	52
Pruning fruit trees	52
Hand spraying	55
Tractor spraying	73
Greenhouse	
Cleaning greenhouse	42
Hand cultivating flower beds	62
Spading and preparing soil	62
Weeding seed beds	69
Potting seedlings	72
Cutting flowers	72

Grounds	IQ
Raking leaves	31
Hand mowing	31
Using sickle	34
Repairing roads	40
Trimming lawn edges	40
Cleaning grass from flag stones	40
Trimming vines from buildings	63
Laundry	
Pulling washers	26
Delivering to cottages	26
Operating extractor	37
Operating washer	37
Operating mangle	37
Sorting laundry by cottage	47
Ironing shirts	51
Dietary	
Cleaning root vegetables	36
Drawing and cleaning poultry	37
Cleaning stoves	44
Mopping floors, washing tables	44
Dishing food at stove	45
Operating potato peeler	45
Assisting at stove, cooking	53
Pantry	
Placing food on tables	30
Wet mopping floors	32
Washing dishes	47
Setting tables	47
Operating dishwasher	57
Cleaning refrigerators	69

Housekeeping	IQ
Sweeping, dry scrubbing	32
Clean tub and toilet	34
Washing windows	40
Waxing floors and linoleum	42
Sorting and counting laundry	47
Assisting in clothes room	54
Carpentry	
Rough sanding, cleaning	53
Climbing ladders with tools	61
Using saw, hammer, etc. on job	61
Painting	
Painting roofs	57
Detailed prime coating	59
Chipping and sanding	59
Clean up after painting	59
Finish sanding	63
Mason	
Rough plastering	83
Mixing mortar and cement	83
Miscellaneous	
Operating mattress machines	60
Truck deliveries, store	59
Filling orders, store	68
Pressing by hand, sewing room	40
Electrician's helper	67

IQ known at which a person has been successful in performance. This acknowledges that some modifications have been made, such as in marking the gauge in pasteurization. In general the duties are actually performed by the person although supervision and checking in most cases are closer than would be given at a true commercial level.

Conclusions

Subjective analysis of the materials obtained from a study of the 200 persons on vocational training at The Training School leads to conclusions of several types. Some of these conclusions result from the total philosophy of the study rather than coming specifically from the data. There seems little doubt that any such study as this and others found in print previously cannot give a minimum mental level necessary for success on a particular job. The following areas are developed in hopes that added counseling in institutions and in communities will result in more and better specific evidence as to true minimum mental levels and other related factors.

First, it appears that many past articles and studies have been based on finding those individuals who stick to a job over a period of time rather than considering the level of those who are actually successful job-wise. Not staying on a job in many cases probably has little relationship to job success in terms of ability but rather is related to personality factors which could have been improved by better habit training earlier, as well as to such factors as motivation, interest, community acceptance, and the like.

Second, while obvious after consideration, the mentally retarded fail on a job for the same basic reasons that so-called normals fail, aside from inadequate fundamental ability. Poor habits, lack of physical attributes, adjustment problems, lack of interest and motivation are some of those which affect all persons and their success on a job. In addition to these, the mentally retarded are more seriously affected in their lack of judgment, comprehension, and the like which cause failure. Added to these is the general factor of organic brain damage which, while usually apparent in perception, coordination, etc., often does not show itself directly. It seems nevertheless to be the only explanation for many job failures on the part of individuals who score on mental tests much higher than others who are successful. Many considerations seem to be results from the above study and to be conclusions for interpretation.

Concept of 'ability to solve everyday problems' by S. L. Pressey —

An organization of factors involved in describing the 'ability to solve everyday problems' has been given by S. L. Pressey of Ohio State University. These five factors help one understand success or failure of persons on the job and in life situations. It can be seen from these factors that mental level is only one, but a limiting one, in solving problems. Certainly, a minimum mental level must exist in the solution of any particular problem, but the complexity of the five factors makes it difficult to specify this minimum. The factors are given below.

(1) Physique and physical vitality. The person, to solve everyday situations best, must have the best physical condition possible. This includes the elimination, if possible, of defects or the reduction of their importance in the person's actions.

(2) Information and skills. Any action in today's society is dependent on the person having certain background information to help in making decisions. Skills in behavior, adjustment, and the like are as important as mechanical and operational skills. These items are usually associated with formal school and training.

(3) Habits and attitudes of work. Not only must a person have information and skills, but he must also have attitudes toward his daily activities which will allow him to produce the more intangible job results including accuracy, consistency, attention to duties, and the like. Habits developed are often almost in contradiction to the knowledge the person has of the job. He knows what and how to do but has not the proper habits for good results.

(4) Emotional tone and stability. To solve everyday questions best a person must be able to integrate satisfactorily the common conflicts of interests and emotions. Neither too positive nor too negative an emotional tone is good. It might be said, however, that a small negative tone is best for success. A small frustration is an inducement to action. No person did anything if there was no feeling of need, an actual 'needling' which caused the person to want to act. Thus, for job success there must be motivation for which the

performance on the job gives satisfaction. It is true that in some cases the motivation present is not best in that it relies on fear, punishment, and the like for its existence.

(5) Constitutional intellectual c a p a c i t y. This is the primary limiting factor in defining the person's 'ability to solve everyday problems' and, hence, in job success. As the other four factors tend to show, most persons are not at their best in these other areas and so are not capable of using to the maximum the mental capacity which they possess. It is in making the person more efficient in the first four, or in reducing the negative aspects of them in certain cases, that we are able to help the mentally retarded to produce results above those usually expected of a certain mental level.

Job requirements for vocational training must be studied individually—

In any analysis of job success consideration must be given to the status of the individual in his various factors. During World War II the War Man Power Commission used analyses of both jobs and persons to fit the individuals to jobs which were within their capabilities. The analyses were more on the physical requirements of the job and concerned with the degree that various parts of the body were involved in job performance. It was found that some jobs could be performed by persons with no feet and only one good arm and hand. Thus, a person who was lacking in these ways but had the good arm and hand could be utilized. After anaylses of many jobs, the next step was the detailed analysis of each person available for job placement and the placement on a job whose analysis compared with the physical qualities present in the person.

This approach would seem to be an excellent one providing the content is broadened to include many other factors in the areas of knowledge and skills, habits and attitudes, emotional stability, other personality qualities, as well as the general mental level together with any specific mental needs or limitations. The latter is especially true for the retarded since the brain-injured, a large group among the retarded, usually have specific areas of mental activity in which the individual is particularly disabled or in which no disablity seems to exist. Thus, we could well use a more complete analysis of both job and individual to make adequate placements and to predict more definitely the possible success.

Several characteristics of job counseling seem worth mentioning. Often, because an individual does one job well, it is assumed that he should do another at the same level with equal success. On the other hand, detailed analysis would show many factors which are different between the two jobs and, hence, explan why the second job may be a better or worse placement. Another consideration is the job name. Many jobs have the same name and superficially appear equivalent in different situations. On careful examination there are fundamental differences which might limit an individual's performance. Comparison of job requirements is extremely difficult without the type of analysis mentioned above. Still another fact is that many parents have had their child in a general school setting until 15-18 years of age where emphasis has been entirely on classroom approach. Then, the parents say they 'want the child to learn how to do something'—in other words, they want vocational training. It is felt, based on experience, that most of these children have developed poor habits and attitudes toward actual work functions but have not learned skills and coordination required in the use of hands, arms, eyes, etc. In many cases the vocational or occupational attempts are being started too late to be most effective.

Critical factor is the amount and quality of supervision —

The literature often discusses the individual's ability to work independently. Actually, very few jobs do not have some type and level of supervision if the job is working in any area not completely operated by the person himself. The clerk in the store always has some supervision. The factory worker has his foreman. In fact many jobs for so-called normal persons include a considerable amount of direct supervision. In some cases the supervisor gives no directions. In others he directs almost every action. This depends on the needs of the situation as well as on the point of view of the supervisors. Training of the retarded should be in a facility capable of offering the best type and degree of supervision with the intent of gradually reducing the amount of direct supervision over a period of time. In many cases retarded persons could be quite effective on a job if the supervisors could accept the problem and give

the amount of quiet consistent supervision needed by the worker. With the present shortage of workers in most fields and especially at the lower levels, it should be possible for many job areas to revise the supervisory situation to allow maximum performance by many retarded persons not now employed.

Many jobs can be simplified to be workable at a lower total level—

As illustrated in Case 'A' this man with IQ 40 operates a pasteurizer handling 700-1000 quarts of milk daily. A red line by the gauge has been marked on the tank. When the mercury reaches the line, the man closes the valve. The supervisor keeps watch and occasionally must make corrections. In general, however, the man is effectively operating the machine. It must be remembered that this same type of guide is frequently used in commercial plants. It points to the fact that many employers would be able to ease their own man power shortage, produce better results, and give jobs to persons not now accepted if an adequate study were made of the actual work processes under their direction.

Place the individual on training activities with real meaning—

Frequent mention has been made that the mentally retarded should not be changed on their training jobs. The retarded are said to be disturbed by change. This is in part true, but, on the other hand, is not realistic if we hope to place the individual in a community situation at any level. No two kitchens are operated exactly the same. No two filling stations ask exactly the same activities from their attendants. To begin with, all too many training situations involve a class situation from which much transfer is expected on the job later. It would seem that a more adequate plan would be to train in situations which are as near as possible to real work situations. This implies a level of on-the-job training after a minimum of formal class training. The philosophy also implies that, once the individual has become moderately efficient in one area, he probably should be encouraged to work at a different training area. Thus, rather than keeping away from change, the retarded individual has learned under careful guidance to accept and to handle a certain amount of change.

In all areas of vocational counseling it has been found that an extremely large number of persons do not find, or are not satisfied with, the area of work in which they were actually trained. For the mentally retarded this is also very true. It is hoped that they will learn under guidance to accept a job and stick to it. On the other hand it must be accepted by professional workers that frequent changes are common and the individuals must have learned how best to cope with them.

Make maximum use of interest inventories and other measurement devices—

Too often in institutions, sheltered workshops, and other similar training facilities training is misinterpreted by most of the employees as 'work' areas. No training area should be so considered until the individual has achieved a relatively high level of job performance. At the end of training a gradual transition is desirable to a feeling of complete job function so that final habits and attitudes are established.

To assist in discovering areas of possible training for an individual use should be made of all of the usual types of devices. The difference is that such materials should be 'clinically administered.' By this is meant that an inventory should not be administered mechanically to an individual who cannot adequately read the material and still expect to use the scores. Many printed materials do not involve an actual need for reading by the individual being examined. The counselor can read the material to the person and record the data. By this procedure many cases have been changed in training areas with remarkable success. The counselor must at no time lose sight of the fact that it is the individual, not the test or inventory, which is to be considered. On the other hand, administration of any such device must not change required considerations and still expect to use the results as prescribed in the manuals.

Several inventories, tests, interviews, etc. can be quite effective in assisting in the placement of the individual on a better job training area as well as in being more certain that motivation, interests, special abilities and disabilities will be taken into account. Often, in addition to the maximum of paper data, trials on several job areas will allow the individual to develop his ideas of the jobs and also will give better prediction to a long-term training placement.

Reports and evaluations are necessary—

As in every area of education vocational training must be evaluated. With the retarded this evaluation must include all the areas of actual work performance as well as the more intangible factors such as attitudes and habits of work. Personality characteristics should be included where they are important to future job success. One point which is frequently overlooked is that the student must himself be a part of the evaluation. He must be allowed to make his estimate of his success and his problems. In this way he can learn to accept more readily the limitations as well as the capabilities which he possesses. A common characteristic with many of the retarded is that they do not see their mistakes. General problem areas must be so evaluated with them that they can learn to make best use of the situations.

Lack of ultimate job success will be common—

Many, if not most, of the moderately retarded ('trainable') will never become productive in any literal sense. Practically none will be even partially independent in total living. Actual production at any independent level is very much an exception to the rule. In addition, many of the mildly retarded ('educable') are never able to live independently in spite of a mental level which may predict such a level of living. To the other extreme, there are quite a few individuals who actually produce on a job placement at a level of success far above that which could be predicted from a study of the mental level alone. We must always be somewhat ambivalent in our thoughts of vocational levels for the mentally retarded. On the one hand, we must be careful not to put undue pressure on the individual to produce in an area in which a fair prediction from mental level and other personality factors would indicate failure or at best low-level performance. On the other hand, we must be equally careful not to deny to the individual possibilities for training simply because an IQ or similar data indicate that success is unlikely.

It is hoped that the time will come when complete job and individual analyses will make for a much improved situation in vocational counseling and in the resultant success of the retarded person on the job in whatever community he may be placed—the open community, the sheltered workshop, the home, or the institution.

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Testing the Hearing of the Mentally Retarded

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Unless the impairment is severe, hearing losses frequently are unrecognized among the multiple-handicaps found in a retarded population. Estimating the retarded child's hearing loss by audiometric and other techniques may be difficult. Other disorders can obscure the diagnosis. Personality disturbances, dysphasias, and other sequelae of cerebral damage prevalent among retarded children confuse estimates of their auditory acuity. Careful differential diagnosis usually will separate those with peripheral hearing losses from those with psychic deafness, dysphasias or other pathologies, although overlapping may occur.

Recent articles have reported results of audiometric testing of mentally retarded children. The percentage of hearing losses runs high. Reports in which 200 or more retarded children were tested give percentages of hearing loss varying from 13 per cent to 55.5 per cent (2, 5, 6). Significant hearing losses were found by Schlanger in 30 per cent of 74 retarded children (7) and 32 per cent of 118 children (8). However, these results are only roughly comparable as the range of frequencies tested varied, populations were diversified in terms of C.A. and M.A., and the criteria for judging the significance of the hearing losses differed. Nevertheless, it is pertinent to point out that independent studies have found from two and a half to ten times more children with hearing deficiencies among the mentally retarded than is found in normal school populations in which an estimated five per cent have auditory losses (4).

This is a report of measures employed by The Training School at Vineland, N. J. in testing the hearing of mentally retarded children. It also describes procedures used in aiding children with hearing handicaps.

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Subjects

The 498 subjects tested were residents of The Training School. The mean chronological age was 28.9 years ±17.3. The mean mental age was 7.8 years ±3.0. (This is a rough approximation since the M.A.'s were computed on the basis of several tests). A division of the total population was made at a C.A. of 20 years in order to separate to a certain extent the effects of advancing age on hearing acuity. It has been pointed out that from a C.A. of 20 years the incidence of hearing loss increases markedly and continues to rise in direct relationship to age (1). There were 210 subjects below C.A. 20 years. The mean C.A. of this group was 13.9 years ±3.6. The older group consisted of 288 subjects whose mean C.A. was 39.6 years ±15.0.

Procedure

In the hearing testing program at The Training School, each child received an audiometric test upon admission and yearly thereafter. The complete range of frequencies of the ADC model P-60-A audiometer was used. Test frequencies were in ten steps, 125, 250, 500, 1000, 2000, 3000, 4000, 6000, 8000, and 12000 cps. The frequencies important to speech, 500 to 4000 cps, were tested first in each ear, beginning with 1000 and proceeding to 4000 cps. Returning to 1000 cps, this frequency was rechecked and followed by 500 cps. After both ears had been checked individually, frequencies 6000, 8000, and 12000 cps were tested in that order followed by 250 and 125 cps.

Some modifications from the usual audiometric techniques were instituted. A longer training period usually occurred so that hand signal responses to tone were learned. Intensity levels of 50 db were fed into each ear at three frequencies, 250, 1000, and 3000 cps, so that the subject knew for what he was listening. In the event that no response was obtained, db levels were raised. This whole training period, brief in some instances, was used as a warm-up period in which fears were allayed and motivation attempted. When this conditioned response technique did not work,

the 'ear-choice' technique (3) was used. The subject responded by pointing to the ear in which the sound was heard. Where a conductive loss was indicated, verification was sought by use of bone conduction stimuli. The bone frequencies used were 125, 250, 500, 1000, 2000, 3000, and 4000 cps. Standard bone audiometric techniques, including masking tone, were employed.

A hearing classification system was used (see Table I) which broadly described the audiometric results and recommendations. Hearing loss classifications could be expanded to include every possible variety of hearing impairment. However, experience has shown that this type of classification has been most practical for The Training School program.

Results

Table 2 gives the results of the audiometric survey. The percentages of those having losses in each classification are indicated. The test findings for the entire population as well as the two segments of the population divided at C.A. 20 years are given.

Thirty-five per cent of the total population fell into the Class I category. A more complete picture of the number with normal hearing acuity for speech is obtained by adding Class II (14 per cent) to Class I (35 per cent). This indicates that 49 per cent of The Training School population had hearing within normal limits for the speech frequencies. A final statistic is not possible in terms of the percentage with normal hearing as Class VI, the 'non-testables' (17 per cent), probably con-

TABLE 1

Hearing classification based on air and bone audiometric testing.

Class	Description	Recommendation
I	Normal. Readings for all frequencies at 15 db or less. May include one reading above 15 db in one or both ears outside speech frequency range.	None.
II	Slight loss. Tests at 20-30 db for two or more frequencies in one or both ears outside speech frequency range.	Biannual diagnostic rechecks and hospital referral.
III	Moderately severe loss in one or both ears but hearing aid prescription not warranted as residual hearing is adequate for communication.	Hospital check for possible pathology. Refer to otologist for recommendations.
.1*	Conductive loss. 30 db or more for frequencies 125, 250, 500, 1000 cps in air conduction test. Bone conduction results usually give improved readings.	
.2*	Perceptive loss. 30 db or more from 2000 to 12000 cps and including frequencies 3000, 4000, 6000 and 8000 cps, air conduction. Approximately same bone conduction readings at 2000, 3000, 4000 cps.	
.12	Mixed Loss. Both low and high frequencies depressed. Any combination of .1 or .2. However, one ear is sufficiently intact for speech reception.	
IV	Hard of hearing. Losses in both ears greater than 30 db but with residual hearing. Interferes with the hearing of speech.	Otological referral by hospital. Program to preserve residual hearing. Use of hearing aid if feasible.
V	Deaf in one or both ears. No response in affected ear(s) at any frequency at maximum output of audiometer.	Depends on whether there is residual hearing in one ear. Otological exam for medication or operation. Hearing aid considered if there is sufficient residual hearing in one ear.
VI	Invalid responses to audiometric testing — 'non-testable.'	Subjective judgment based on overt responses to noise, music, conversation.

*Followed by R or L designates impaired ear in any Class III sub-group. Without these appended symbols, it is indicated that both ears are impaired.

TABLE 2
Results of an audiometric survey of 498 mentally retarded subjects.

	Hearing Classification	C.A. 5-20 yrs.	%	C.A. over 20 yrs.	%	Total	Total%
I	(Normal)	108	51.4	65	22.6	173	34.7
II	(Slight Deviation)	26	12.4	44	15.3	70	14.1
III							
	.1 L or R (Conductive)	9	5.2	9	4.5	18	4.8
	.1	2		4		6	
	.2 L or R (Perceptive)	16	17.1	8	27.2	24	22.9
	.2	6		43		49	
	.12 L or R (Mixed)	11		3		14	
	.12	3		24		27	
IV	(Hard of Hearing)	6	2.9	24	8.3	30	6.0
V	(Deaf)	1	0.5	4	1.4	5	1.0
VI	(Non-Testable)	22	10.5	60	20.8	82	16.5
Total		210		288		498	

tained many who possessed normal auditory acuity. Granting this assumption, one could say that over half of The Training School population had normal speech hearing. Thirty-five per cent (Classes III, IV and V) had demonstrable hearing losses which were significant and indicated a need for conservation or remediable measures.

The 288 subjects in the group whose C.A. was over 20 years demonstrated greater hearing impairment than the 210 subjects under 20 years. Sixty-four per cent of the younger group were in Classes I and II as compared to 38 per cent of the older subjects. Another finding was that 78 (27 per cent) of the older subjects exhibited III.2 and III.12 losses as compared to 36 (17 per cent) of the younger group.

The children in the Class VI group were, for the most part, the lower grade children. Three out of four of the 'non-testables' had mental ages below five years. However, 27 other children with mental ages below five years responded validly to the audiometric test and were classifiable. A rough estimate indicated that one out of three retarded children in this survey below a mental age of five years could be tested audiometrically.

Class VI was reduced considerably by the use of the 'ear choice' technique. Many who would not respond validly to the conditioning usually attempted in pure-tone testing, responded well to this technique.

Among the 'non-testables', 51 of the 82 children had personality ratings demonstrating disturbances ranging from poor adjustment and neuroses through various psychotic behavior patterns. Further, more than four out of five had social quotients below 40. The etiological breakdown of primary causation of mental retardation revealed that 45 of the 'non-testables' had a central nervous system impairment and 21 were mongoloid; the remaining 16 were of unknown etiology or in other categories.

Recommendations

If a child's hearing was Class III, IV, or V (and sometimes VI), he was referred to The Training School Hospital for examination. From there, the subject was scheduled for examination by an otologist. If pathology was found, a medical treatment program was instituted. If medical treatment was recommended, the hearing aid was not fitted until such treatment had been completed. Subjects still in need of amplification were given a trial period with an aid. Usually the aid was tried with subjects who demonstrated a loss in the better ear of 30 db or more in the speech frequencies.

A demonstrable loss of hearing in the retarded child was just one of the factors involved in the selection of cases for hearing aid trial. Personal responsiblity and adjustment also were important. Careful weighing of these factors was necessary in order to gain an accurate prognosis for hearing aid therapy. After considering the initial observations and reports, a trial period was instituted. During this trial the subject was introduced to amplified sound gradually, and a strong positive attitude toward the hearing aid was developed. In qualified cases speech reading instruction was given as a supplementary means to effective communication. Where needed, speech correction was instituted.

At the conclusion of the initial training period of two months with the aid, the individual's responses were evaluated. If he demonstrated a lack of responsibility for, or benefit from the aid, a further training period was then given. In subjects with unfavorable prognoses based on trial therapy, the use of the aid was discontinued. However, if cases were originally prognosed carefully, the latter course was not necessary.

The following are illustrations of boys who benefited through the use of hearing aids:

When Billy came to The Training School at C.A. 11 years, he obtained a WISC Performance I.Q. of 54. He had no speech other than jargon. He was a behavior problem with many aggressive reactions. The psychological diagnosis was: mentally deficient, moron level; etiology, congenital cerebral defect caused by measles during pregnancy. The hearing diagnosis was Class IV, mixed type hearing loss with all frequencies depressed severely, and aphasic-like symptomatology. Training with a hearing aid was instituted along with a combined audio-visuo-kinaesthetic approach to language and speech. Response to the aid was variable and erratic. In time he learned that the aid was a benefit to him in working and playing with his classmates. At present, he is using the aid at all times in the clinic and classroom. His behavior problems have been largely alleviated. He can now use phrases and short sentences, though sentence development is still highly unstable. His WISC Performance I.Q., 87, places him at the borderline level of intelligence. His VSMS social quotient is 78 in spite of handicaps. Within another year Billy should be responsible enough to wear the aid to his cottage evenings and weekends. Though the aphasic problems still remain, hearing aid benefits have produced a more favorable prognosis for speech therapy and language devlopment.

George, 10 years old at entrance, had a Binet I.Q. of 65; etiology, trauma during birth; well-adjusted personality. Audiometric testing indicated serious binaural hearing losses for high frequencies as well as moderate losses in low frequencies, Class IV. His speech was severely dyslalic. He has been wearing a hearing aid for one and one-half years. Though he was adept at speech reading, classwork suffered as he missed discussion and oral communication with fellow students. At present, his speech still contains some sound distortions though it is readily intelligible. He wears the aid at all times and has assumed complete responsibility for it. His improved reactions with the aid have been one of the factors which eventually will enable him to return to his community as a useful citizen. Steady gains have been observed in I.Q. scores. Now 15, he functions at the dull normal level with a WISC full scale I.Q. of 79; the performance I.Q. is 95, and the verbal is 67. The VSMS social quotient is 106.

In addition to these two boys, five others were wearing aids. Four wore them on a full-time basis, and one wore his in class only. Three others with a favorable prognosis for hearing aid use were to begin trial periods in the near future. Most subjects with a C.A. above 20 years, who had been selected as qualified, adapted well to the mechanical aspects of the aid. After learning to maintain and adjust the aid to their needs, they reported to the clinic weekly for equipment and repairs. As a rule, these cases were at the moron level, demonstrated good adjustment, and had acquired hearing losses after speech emerged.

Conclusions

Hearing difficulties which are prevalent in a large proportion of mentally retarded populations may go undetected because of other more prominent abnormalities. Hearing losses, when they occur, should be considered as contributing in some measure to educational and social retardation, particularly among higher grade retarded children. While the mental retardate may be functionally unaware of the finer differentiations between sounds, most are capable of responding validly to pure-tone audiometric testing. Hearing losses are not 'caused' by mental retardation but may stem either from the same pathology of which mental retardation is a symptom, or the two conditions may be wholly unrelated etiologically.

Difficulties in testing the hearing of the mental retardate were experienced among the low-grade or very young, slow developing subject. The former usually included those with neuro-psychiatric disorders; the latter probably did not realize the significance of the test sufficiently to offer a valid response. In this instance, they appeared to function on the level of younger normal children. In such cases, psycho-galvanic testing may have offered valid results. However, there was a high incidence of cerebral insult in this group of young retardates which might have affected PGSR audiometry results.

It may be concluded from this study that in the routine examination of all retarded children, hearing testing should be included. The psychologist attempting tests which rely heavily on verbal methods that penalize the child with a hearing problem, needs information concerning the child's ability to hear.

The educator could utilize the information of a child's hearing loss and adapt teaching methods which would enable the child to achieve his potential.

Summary

Pure-tone audiometric tests were administered to 498 mentally retarded subjects at The Training School at Vineland, N. J. The subjects were classified according to the severity of their hearing impairments. Test results indicated that approximately 35 per cent had normal hearing, 14 per cent had only slight deviations at extreme frequencies (essentially normal), 28 per cent had moderate losses, six per cent were hard of hearing and one per cent deaf. Subjects with a C.A. over 20 years demonstrated greater hearing impairment, particularly in the high frequency area, than those under 20. Seventeen per cent of the population were 'non-testable'. These children usually were below a mental age of five years, had personality disturbances of varying degrees, and had social quotients below 40. Four-fifths of this group were either of organic or mongoloid etiology. Recommendations included hospital referral, otological examination and treatment, hearing aid amplification whenever feasible, speech reading, and speech correction.

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Experience with Conditioned GSR Audiometry in a Group of Mentally Deficient Individuals

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Because of the potential usefulness of the conditioned auditory galvanic skin response (GSR) for assessing the hearing of individuals in whom cooperation is difficult to achieve, it is natural that this method be considered in relation to mentally deficient populations. For example, Schlanger and Gottsleben (5) have recently raised the question of applicability of GSR testing to the "low grade or very young, slow developing subject" whom they described as "non-testable" by voluntary or learned motor response.

In addition to the diagnostic aim in applying GSR testing to such a group, theoretical interest arises from Goldstein's observation (2) of a correlation between low IQ and difficulty of conditioning. Although further research at the same institution (3) failed to demonstrate this correlation, the second study was limited to normal subjects with I. Q.'s above 110.

With these questions in mind, we decided to attempt GSR audiometry in a small group of mentally deficient individuals, utilizing our recently developed technique for cathode ray recording of GSR's (4). Since this was our initial experience with such patients and with the new facilities, several modifications in technique were made during the course of the project. For that reason and because of the small number of subjects this report must be interpreted as a summary of our clinical experience with a series of individuals rather than as a controlled experiment. Our aim with this group was two-fold: 1) to examine the conditioned GSR for differences in physiological form or ease of establishment, and 2) to obtain some indication of the validity of GSR audiometry by investigation of the relation between GSR auditory thresholds and the voluntary threshold.

The group was composed of 20 individuals institutionalized as mentally deficient in the Southern Wisconsin Colony and Training School.[1] Sixteen were selected by the Colony on the basis of known or suspected hearing loss. At the request of Dr. Ionel Rapaport of the Wisconsin Psychiatric Institute, four patients classified as mongoloid with no known hearing loss were also included. Four of the sixteen selected because of hearing difficulties had a history of epilepsy and were on anticonvulsant medication at the time of our tests.[2] The group included twelve masculine and eight feminine subjects ranging in age from 9 to 38 years. Since the I. Q.'s of the individuals had been tested by the Colony at different times and with different tests, we do not feel that the available I. Q. data can be used with precision. Nevertheless, the values (range: 23 to 72, median: 50) were sufficiently low to represent a group that is not only significantly lower in I. Q. than that tested by Goldstein (3) but also below the accepted values for the normal population.

Technique

The GSR input circuit was similar to that of Stewart (5). The subject was connected to a 3 volt battery through a 100,000 ohm resistor. Variations in electrical potential across the subject were capacitor-coupled to the vertical amplifier of the cathode ray oscilloscope. For subjects of average skin resistance (of the order of 30,000 ohms) the circuit measured primarily changes in skin resistance. For subjects of very low resistance it is probable that the recorded responses represented a mixture of potential due to resistance change plus the

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1. The subjects were brought to Madison for our tests through the cooperation of Dr. Leslie A. Osborn, Director of the Division of Mental Hygiene, State Dept. of Public Welfare, and Mr. John M. Garstecki, superintendent of the Colony. We are also greatly indebted to the members of the Madison Area Council on Retardation who volunteered to care for the subjects during their stay in Madison.
2. The four mongoloid patients are referred to below as subjects No. 3, 6, 9, and 13. The four epileptics are subjects No. 1, 2, 5, and 14.

Tarchanoff potential (7). Partly because of this complication but primarily for more meaningful specification of response magnitude, we have now shifted to a circuit which measures changes in skin conductance (4).

The positive GSR electrodes were 1 cm, square tin plates held to the finger pads with masking tape. The negative leads were grounded stainless steel springs around each wrist. EKG paste was used on both electrodes. The responses were recorded bilaterally using two dual beam cathode ray tubes, one for visual observation, and the other for photographic recording on an automatic camera which registered each sweep on a single frame of 35 mm. film. The records were analyzed in a microfilm reader.

The tone was turned on 0.2 second after the start of the oscilloscope 7-second horizontal sweep by means of an electronic switch. The rise time and fall time of the tone were both approximately 0.2 second and the duration of the tone (manually controlled) was usually such that the tone ended when the shock occurred. The subjects were located in a sound-insulated room, the walls of which were lined with a 3⅝ inch layer of glass wool. The tones were presented by means of a Jensen RP-201 horn-loaded driver unit located at head level directly in front of the subject at a distance of approximately two feet. Thus the use of "free-field" stimuli resulted in effectively limiting the tests to the better ear at each frequency.

One hundred per cent shock reinforcement was used (a shock following every tone). The shock was triggered automatically 2.8 seconds after the onset of the tone. For the first four subjects the shock consisted of a single 5 msec. rectangular pulse, while for the remainder of the group a 0.1 second burst of 5 msec. pulses repeated 100/sec. was used. The shock electrode pair was attached to the inner surface of the leg just above the ankle.

Procedure

The first step after attachment of electrodes was the establishment of a shock threshold as the least shock voltage which yielded reliable GSR's. A shock voltage between 1.3 and 2.0 times the threshold value was generally used for the remainder of the test.

After a suitable value for shock intensity was found, paired tones and shocks were presented using a 1000 cps tone generally 40-60 db above the subject's presumed threshold. This was continued until either reliable responses to tone were achieved or the test was abandoned. A response to tone was defined as any visible decrease in resistance of reasonable wave shape beginning from 0.8 to 3.5 seconds after the tone onset. The requirement of reasonable wave shape was included in our definition of a response because of the possibility of artifacts due to movement. These can usually be recognized by their rapid time course. If reliable response to the 1000 cps tone was secured, the intensity of the tone was reduced until a level was reached at which approximately 50% of the presentations yielded tone responses. This level was taken as the GSR threshold. The procedure was repeated at 500 and 4000 cps. Following the GSR test an attempt was made to obtain voluntary audiometric thresholds at the same frequencies.

Results

Table 1 shows the results of the threshold determination. The GSR and voluntary thresholds are expressed in db of hearing loss, that is, as elevations of these thresholds relative to the zero-loss reference values determined for our acoustic stimulator by a combination of testing of normal subjects and sound pressure measurements. Note that the blanks in the table are explained in the column at the right. Two subjects, 13 and 19, became so emotionally upset that we made no attempt to secure data. Of the remaining 18, a total of 3 subjects, nos. 2, 4, and 14, failed to give reliable conditioned responses (C.R.) so that the test was abandoned without GSR threshold determinations. One subject, no. 6, could not be induced to give voluntary responses.

The asterisks identify values which we believe illustrate an important point. Note that the explanation at the bottom of the table states that analysis of the film records indicates that the GSR hearing loss is probably less than the values shown. This difficulty originated in the fact that analysis of the film in these cases showed that small responses were still occurring at the lowest tone intensities presented during the GSR threshold search. These lowest intensities had been judged to be below threshold on the basis of direct visual observation of the oscilloscope

while carrying out the test. This situation emphasizes the importance and difficulty of observing the smallest changes in resistance which can be read reliably against the background of spontaneous fluctuations.

Table 2 exhibits the difference in db between the hearing loss determined by GSR and by the voluntary test. The values represent GSR hearing loss minus voluntary hearing loss. Hence a positive number indicates that the GSR loss was greater than the voluntary loss or, in other words, that the GSR response was less sensitive than the voluntary. It can be seen that even when the signs of the differences are taken into account, the mean values of the differences on the bottom line were positive at all frequencies showing that, on the average, the GSR thresholds were from 6 to 9 db less sensitive than the voluntary.

TABLE 1
GSR vs. voluntary hearing loss at three frequencies

Subject No.	Hearing Loss in Db						Explanation of Omission
	500 cps		1000 cps		4000 cps		
	GSR	Vol.	GSR	Vol.	GSR	Vol.	
1.	40	—10	20	0	60	30	
2.		10		20		0	Inadequate C.R.
3.	30	25	30	25	15	20	
4.		10		10		15	Inadequate C.R.
5.	— 5	—15	10	—10	0	0	
6.	25		20		30		No voluntary R.
7.	15	15	25	10	15	15	
8.	40*	40	40*	45	10*	25	
9.	40	20	40	20	30	15	
10.	0	— 5	0	—10	5	5	
11.	20	35	40	50	60	60	
12.	0	— 5	10	5	10	5	
13.							Emotional Upset
14.		—10		—10		— 5	Inadequate C.R.
15.	5	5	10	15	—10	— 5	
16.	40*	0	20	15	70*	10	
17.	10	0	10	25	— 5	5	
18.	10	0	15	5	0	5	
19.							Emotional Upset
20.	—10*	0	5	5	—10*	0	

*Film analysis indicates hearing loss is probably less.

As one measure of the varying success with which conditioning was achieved, Table 3 illustrates the relation between the percentage of tones to which GSR responses were made and our clinical decision either to continue or abandon the GSR test. In this calculation the total number of tone presentations was used, including those below threshold; thus no subject could achieve 100 per cent response. Notice that the 3 subjects in whom we decided to abandon the GSR test had percentages of 31 or below while the others were all above 52. This table should not be taken too seriously, as our decisions to abandon or continue were based on the total clinical situation which included, particularly for the first 4 subjects, our own lack of security with the technique. It should also be pointed out that two of the inadequately conditioned subjects were among the initial group of four subjects on whom the less effective, single-pulse shock was employed. Nevertheless, it happens that two of the 3 subjects on whom the GSR was abandoned, nos. 2 and 14, are among the 4 subjects having a history of epilepsy. Further, the subject who gave the lowest percentage of responses to tones, no. 14, is a patient on whom a neurological examination had yielded

TABLE 2
Difference in db between hearing loss by GSR and voluntary test

Subject No.	GSR Minus Voluntary Hearing Loss		
	500 cps	1000 cps	4000 cps
1.	50	20	30
2.	Inadequate Conditioned Response		
3.	5	5	— 5
4.	Inadequate Conditioned Response		
5.	10	20	0
6.	No Voluntary Response		
7.	0	15	0
8.	0	— 5	—15
9.	20	20	15
10.	5	10	0
11.	—15	—10	0
12.	5	5	5
13.	Emotional Upset		
14.	Inadequate Conditioned Response		
15.	0	— 5	— 5
16.	40	5	60
17.	10	—15	—10
18.	10	10	— 5
19.	Emotional Upset		
20.	—10	0	—10
Mean Disregarding Sign		12.8	10.4	11.4
Mean Recognizing Sign		9.3	7.8	5.7

TABLE 3

Abandonment or continuance of GSR test as related to percentage of conditioned responses

Subject No.	GSR Test Abandoned	$\frac{\text{No. of C.R.}}{\text{No. of Tones}} \times 100$
1.	No	53.
2.	Yes	15.
3.	No	62.
4.	Yes	31.
5.	No	63.
6.	No	53.
7.	No	64.
8.	No	87.
9.	No	58.
10.	No	67.
11.	No	52.
12.	No	58.
13.	Emotional Upset	—
14.	Yes	4.
15.	No	72.
16.	No	59.
17.	No	73.
18.	No	75.
19.	Emotional Upset	—
20.	No	89.

the following results: chronic brain syndrome (question of birth injury) with mixed type of epilepsy, cerebral atrophy and mental retardation.

Although, as pointed out earlier, the available I.Q. data are not considered to be strictly comparable among our subjects it can be said that there does not appear to be any obvious relation between I.Q. and degree of success in carrying out conditioned audiometry.

Before beginning this series of patients we had decided to continue recording GSR's throughout the voluntary test, anticipating that we would see the GSR's extinguish soon after discontinuance of the shock. We were thus rather surprised at the extent to which GSR's continued throughout the voluntary test. Table 4 shows the difference between the hearing loss measured by the presence or absence of the GSR's which occurred during the voluntary test period and the hearing loss based on the voluntary response itself. Again the values represent GSR hearing loss minus voluntary loss so that a positive number indicates the GSR threshold was higher or less sensitive that the voluntary. Perhaps the most interesting result in this table is the fact that subjects 2, 4, and 14 (on whom the **conditioned GSR's** had been inadequate for threshold determinations a few minutes earlier) exhibited **GSR's accompanying their voluntary responses** down to threshold or near-threshold values. Apparently their failure to give conditioned GSR's did not stem from malfunction of the peripheral sympathetic mechanisms.

TABLE 4

GSR as concomitant of voluntary response

Subject No.	Hearing Loss Measured by GSR Accompanying Voluntary Response Minus Hearing Loss Measured by Voluntary Responses		
	500 cps	1000 cps	4000 cps
1.	0	0	—10
2.*	0	10	0
3.	5	0	0
4.*	— 5	0	0
5.	0	5	— 5
6.	No voluntary R.	No voluntary R.	No voluntary R.
7.	— 5	0	—10
8.	0	0	5
9.	No GSR	No GSR	No GSR
10.	No GSR	No GSR	25
11.	No GSR	No GSR	10
12.	— 5	5	0
13.	Emotional Upset	Emotional Upset	Emotional Upset
14.*	10	20	No GSR
15.	0	0	0
16.	5	0	15
17.	5	— 5	5
18.	5	10	0
19.	Emotional Upset	Emotional Upset	Emotional Upset
20.	0	0	0
Mean Difference Disregarding Sign	3.2	3.9	6.1
Mean Difference Recognizing Sign	1.1	3.2	2.5

*Inadequate conditioned response.

All repsonses were analyzed for latency and amplitude. Comparision of these values with other studies and even among the subjects within this study is complicated by the fact that latency and amplitude both vary with tone intensity (1). Although the presentation sequence of tone inten-

sities differed rather widely throughout our study, we have computed mean latency and amplitude values for each subject. We have for this analysis used only those trials for which simultaneously recorded bilateral latencies and amplitudes could be measured. The values obtained by averaging the conditioned GSR mean latencies for both hands of all successful subjects was 1.9 seconds. This value is close to the 2.0 second mean latency found by Goldstein (2) in deaf and aphasic children and is typical of latencies in normal subjects.

The range of mean unilateral latencies was from 1.6 to 2.7 seconds. For most subjects the responses were quite symmetrical in the two hands, both for amplitude and latency. However, for the two subjects having a history of epilepsy for whom adequate bilateral data were available (nos. 1 and 5) the differences between the mean latencies of the left and right hands were 0.8 and 0.5 second, respectively. For the 14 other individuals with adequate bilateral data, the difference between the mean latencies of the two hands did not exceed 0.16 second and averaged only 0.06 second. The mean latencies of the slower hands of the two epileptics were also the two longest unilateral latencies observed in the entire group, being 2.5 and 2.7 seconds. The asymmetry in latency in the two epileptics was accompanied by inequality of amplitudes on the two sides such that the side of shorter latency exhibited a mean amplitude almost twice that of the slower side. This finding is suggestive of a relation often seen in neurophysiology. In recording the summated potential envelope of a large number of neural units, decreased activity is typically accompanied by increased latency.

Discussion

The lack of agreement between GSR and voluntary thresholds seen in Table 2 is greater than we have experienced in subsequent groups of normal subjects. Just how many of these discrepancies are caused by the nature of the subjects and how many stem from imperfections in our technique is difficult to state.

Several of the deviations, e.g., subjects no. 1 and 16, could be interpreted as progressive extinction of the conditioned response, for fair agreement was obtained at the initial test frequency of 1000 cps but poorer results at the later 500 and 4000 cps frequencies. Perhaps a more adequate conditioning technique might have resulted in less extinction in these subjects and conceivably might have yielded satisfactory conditioning in the three subjects for whom the test was abandoned. Recent research in our laboratory with normal subjects (1), for example, has shown much stronger conditioning when the interval between tone onset and shock was 0.6 second instead of 3.0 seconds. Hence we do not interpret the present results as representative of the ultimate degree to which GSR audiometry can be developed with mentally deficient subjects.

A further limitation of this study is its failure to furnish much information on what might be considered the major practical question—the extent to which GSR audiometry can be relied upon in subjects incapable of voluntary testing. Unfortunately, our group included only one such subject, no. 6, on whom we could not obtain a voluntary audiogram. This subject, a 10 year old girl at the time of our test, was classified as mongoloid and had an I.Q. of 23 obtained at age 6 on the Kuhlmann test. Although there was no other audiometric information with which to evaluate our GSR thresholds, it can at least be said that conditioning was easily achieved (two trials) and the GSR thresholds were compatible with her observed behavior.

With respect to the question of a relation between I. Q. and ease of conditioning, the results demonstrate that reasonably satisfactory conditioning can be achieved in subjects of low I. Q. The three subjects on whom inadequate conditioned responses were obtained had I. Q.'s of 42, 52, and 58 and thus were not at the low end of our I. Q. range.

The negative values in Table 2 (less hearing loss by GSR than by voluntary test) might be interpreted as failure to maintain cooperation of the subject down to the "true" voluntary threshold. If this interpretation is made, a GSR enthusiast might hold that the technique is of value in such a group, especially when it is noted that the voluntary test could be carried out only by continued prompting and encouragement. However, for subjects of this character (able to give voluntary response with sufficient training and encouragement) there is doubt in our minds whether the unpleasantness and complication of GSR testing can be justified. In our results, the

GSR threshold was never more sensitive than the voluntary by more than 15 db and even this value was achieved in only 3 of the 42 threshold comparisons in Table 2.

We believe our most significant result is the demonstration of essentially normal conditioned GSR's in the major portion of a group of individuals of low I. Q. with restriction of abnormalities in physiological form of the response to the two subjects having a history of epilepsy. Whether the asymmetries and difficulty of establishment noted with our epileptics were actually the result of epilepsy or due to the medication cannot be established from our data.[3] It is clear that depressants in sufficient dosage interfere with establishment of conditioning; it is more difficult to understand how drugs could lead to pronounced unilateral effects. If a history of epilepsy is accepted as equivalent to brain damage, our results may be added to the growing body of information linking abnormalities of conditioning with lesions of the nervous system.

3. Dr. W. G. Hardy during a panel discussion of GSR audiometry following the presentation of this material at the 1956 ASHA meeting mentioned that aberrant conditioning effects with epileptic subjects might well be expected on the basis of the effects of drugs used for control of epilepsy.

Note: The authors wish to express their appreciation to Miss Joan Copley, who acted as companion and manager of our subjects throughout the test sessions.

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Psychotherapy with the Mentally Retarded
A Case History[1]

HARVEY L. GLASS, Ph.D.

Introduction

Studies of psychotherapy with the mentally retarded and mentally deficient continue to be sparse in the literature. Neham (5) has reviewed and evaluated some of the work in this area up to 1950. A brief but interesting comment at the seventy-seventh annual meeting of the American Association on Mental Deficiency in 1953 concludes, in part, "Above all, we must stop thinking of the retarded individual as emotionally insensitive, unable to adopt social values, and with no aptitude for human relatedness. This is an uncharted field, and systematic research is needed." (2) A most comprehensive and pertinent anaylsis of psychotherapy with those possessing a social-intellectual deficit is presented by Sarason (6). In 1954, Heiser (4) wrote specifically on the nature of such psychotherapy in the residential setting as a follow-up to an earlier article of his (3).

As is characteristic of research in therapy with those of normal endowment, research with mentally retarded subjects is beset by problems of controls, definitions of the illness, condition or level of the patient prior to treatment and, finally, the criteria of improvement. Further, the research scientist dealing with investigations of therapy remains in serious need of the clinician's description of the treatment in observable, objectifiable, and quantifiable terms.

However, before one can start to develop hypotheses or theories suitable for formal investigation, one requires a substantial amount of raw data from which to extract various possibilities. It is in the light of this requirement that the following case is presented.

The Issue

Our concern is primarily with the method of treatment. Theories of psychotherapy have not yet reached the degree of perfection which allows for accurate prediction of the course and outcome of treatment. Superimposing the methods of a weak theoretical system prematurely may prevent the therapist from recognizing pertinent information. Thus, an eclectic view is espoused in an effort to keep attention directed to the discovery and evaluation of special techniques for individual problems.

For instance, psychotherapy with the retarded may not readily lend itself to highly intellectualized forms such as orthodox analysis or client-centered nondirective treatment. Yet, when play or relationship therapies are used, certain techniques and principles of analytic and client-centered approaches are utilized. What, then is the method of choice? Such a question would not seem as valuable as the determination of what devices are effective and suitable with specific, individual problems.

In the case history which follows, three major points are illustrated. First, in 58 meetings, virtually no interpretations were attempted by the therapist and, of the few that were tried, only one was considered to have reached the child. Second, an emotional outburst of some length and severity occurred but it is debatable whether this was abreaction in the analytic sense; parsimoniously, it may have been a reaction and re-adjustment to problems confronting the child in the immediate present. Finally, the therapy might be termed "relationship therapy" but it cannot be emphasized enough that this designation does little to define any unique form of treatment (cf.1,pp.47ff.).

Jerry

Jerry is an attractive 12 year old boy, one of three children from the well-adjusted home of a successful professional man. Jerry's younger sibling is a girl, and the older one a boy, both healthy, successful students living at home, and both differing in age from Jerry by three years.

Difficulty was first observed when Jerry was an infant, taking the form of "blackouts" —probably seizures. Subsequent extensive examinations resulted in a diagnosis of idiopathic epilepsy. Psychological examinations from 1953 to 1957 revealed intelligence quo-

1. Case consultants: Norma Wohl, M.D., and Mortimer Garrison, Jr., Ph.D.

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tients ranging from 60 to 78. The etiology of the moderate mental retardation was recorded as "undifferentiated." From 1953 to 1955, Jerry attended a special residential school after completing the first grade in public school. Since 1955, he has been enrolled at The Training School in which the following treatment took place. Over the years, seizures have been relatively rare and mild, being controlled by anti-convulsant medications of varying types and combinations. Educational achievement tests in the course of therapy indicated that Jerry was achieving between the second and third grade levels, corresponding with the mental age of 8 to 9 years obtained on intelligence examinations.

Jerry related that he had had behavioral difficulties at home prior to subsequent special school enrollment; he did not adjust well at the first school he attended away from home. He was abusive toward children smaller than himself, tripping them and throwing objects at them from ambush. He was overtly aggressive and destructive.

His difficulties in the present setting started approximately six months after his arrival when, after the initial good adjustment, he reverted to his old ways. A summer vacation at home followed and upon his return to school, Jerry's acting out became sufficiently serious to warrant some form of intervention. The precipitating incidents which brought Jerry to treatment were truancy from classes, destructiveness in classrooms, throwing apples and stones at traffic on the highway, stoning the windows of adjacent private property, and striking small children. In addition, Jerry's parents and family physician suggested a reduction in anti-convulsant medication, thinking that Jerry's senses were being dulled and his aggressiveness stimulated.

From the start, treatment goals were limited. A major personality change was not sought; increase in I.Q. and return to the community were not expected. What was desired was a removal of the symptoms described above. Therapy meetings lasted for three quarters of an hour, twice a week, for eight months. Initially, Jerry's response to any conversation was, "Let's not talk about it." His reluctance to deal in a verbal interchange presisted until nearly the end of the therapy series. There seemed to be so much to be done immediately that conversation would be dilatory. Further, it was not easy for Jerry to express himself verbally and so the therapist for expediency abandoned the idea of discussing thoughts and feelings.

Jerry's problem was right at the surface from the start. He felt as if he had been rejected by his family and he deeply resented his school surroundings. His every effort, avowedly so, was to misbehave to the extent that his parents would be forced to take him back. Jerry had a history of having been physically punished and certain aspects of his behavior were starting to take on sadomasochistic qualities. He wanted to hurt and be hurt in return. Discipline seemed to be of diminishing effectiveness—his characteristic attitude was, "I don't care."

The problem was very swiftly acted out in therapy. Starting to demolish completely the playroom doll house on his second visit, he turned in two more meetings to attacking the therapist on walks about the grounds. For three consecutive sessions, despite the reaffirmation of limits by simple, immediate termination of the hour, Jerry pelted the therapist quite accurately with apples and stones. As the therapist withdrew, he firmly offerred the appointment for the next therapy session and a tardy slip for school. In bitter tears, Jerry refused both. Yet, he would appear punctually for the following therapy hour. Two quiet sessions occurred followed by two more of attacks with Jerry hurling stones at the therapist, his car, and the steps and porch of the office building. Absolutely no discussion of feelings during these incidents took place; Jerry steadfastly would not allow it, nor did he ever discuss the incidents themselves on later occasions. As suddenly as it had started, the storm subsided. Jerry tapered off with a few sessions of acrid verbal attack on the therapist. "Your office stinks! I hope your wife dies," and other such remarks constituted most of Jerry's communications. Soon, his behavior and attitudes seemed to become positive and friendly. He began in a clumsy way to draw close to the therapist—searching his pockets, combing his hair, giving him small tokens of friendship, and offering to share his family's possessions. In this period, he persisted in asking the therapist to accompany him home. The therapist in return simply presented reality and acted as a friend. No active attempt was made to re-direct Jerry's thinking or to re-educate

him in social situations. He was permitted to invade classes which were in session and to walk into administration offices during the therapy hours. The essence of middle sessions of Jerry's treatment series was that he possessed the undivided attention of some adult for endless hours and the situation was virtually discipline-free. By this time, one of the two anti-convulsants had been withdrawn and Jerry experienced his first seizure in nearly four years within a month of the withdrawal and in the second month of psychotherapy.

One morning, Jerry spontaneously started to relate some of his experiences prior to leaving home. The therapist commented on Jerry's obvious current anger, eliciting something of a look of wonder from the youngster and the question, "How do you know I'm angry?" This marked the second turning point in the treatment. A period of two months followed filled primarily with pleasant companionship. In this period, Jerry ceased asking the therapist to leave the school to go home with him and developed the idea that his (Jerry's) family ought to move next to, and work at, the school. He was now attending school regularly, had stopped acting out aggressively, and had taken a greater interest in scouting activities. He also began to assist his cottage parents with minor chores, and was clearer in his verbal expressions.

It was not known whether the therapy was complete when Jerry's parents informed him that for financial reasons they were terminating treatment. Within two weeks, Jerry experienced another seizure and a rash of aggressive acts occurred. He was reported as wandering out of classrooms again. Of course, some of this behavior is expected at the termination of treatment as the patient's protest. Evaluation of the permanent effectiveness of therapy must await the passing of time. At the time of this writing, Jerry is on summer vacation with his family and the medication remains reduced.

Summary

Psychotherapy with the mentally retarded and mentally deficient is in need of considerable study. Before hypotheses and theories can be drawn up for experimental examination, facts must be collected which require being put in order. The case history of Jerry has been offerred in an over-simplified manner primarily to illustrate certain of the phenomena of therapy. The first of these was the straightforward acting out of the aggressive impulse against the therapist. Second, there was the nearly complete absence in the entire therapy series of "interpretations, clarifications of feelings" and other intellectualized verbal exchanges, and third, there was the absence of a superimposed theory of treatment. The question of what constitutes the basic nature of psychotherapy is still unanswered. It is hoped that a systematic collection of successes and failures may one day provide that answer.

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Book Review

"Unsettled Children and Their Families"

Dr. D. H. STOTT

Much has been written and much more will undoubtedly be written concerning the problem area which Dr. Stott has tackled in this very readable book. More often than not the author adopts a sound, common-sense approach to solving the problems confronting the maladjusted delinquent in England today. In this civilized world of ours, where rampant psychoanalysis and cold, unswerving statistics sometimes seem to be the order of the day, Dr. Stott's views, attuned as they are to the layman's ear, come as a refreshing reminder to keep everything in its proper perspective. An example comes immediately to mind — the author's assertion that "the maladjusted child knows instinctively that the finer ways of sorting out the details of test situations have nothing to do with his emotional hunger. That is chiefly why maladjusted children do so badly at intelligence tests." Truly, Dr. Stott's fourteen years of "School Mastering" shows through his writings. Throughout the book the child's instinctive need for a reliable, as opposed to "good", family is borne out. The author has listed a classification of families into twelve basic categories, patterns A to L from which situations develop the varied and unsettled maladjusted youngsters. Very interesting examples are given of both the diagnosis and the treatment for the products of homes, A to L inclusive, plus additional examples. Much of the diagnosis and treatment, for that matter, has been prescribed by "untrained" clinicians, teachers and social workers for "there is a very grave danger of decreed social workers becoming so scientific in their dealings with children that they cease to remember that the greatest wisdom lies in having an understanding heart."

Dr. Stott's writings would indicate that England is somewhat in arrears of the United States in certain phases of psychological testing and counselling in the public schools. He dwells at length on the English psychologists' deadly fascination for the IQ figures, a situation of which we in America have long been aware. He sees the need for school counselling in the matters of family relations and this we in the United States have been doing for some time. He speaks of the aloof psychologist bursting onto the scene for a quick testing situation then disappearing rapidly with all the truth wrapped up in his test results. Either these are severe indictments of England's psychological practices or else Dr. Stott is misinforming us. There is some question also as to whether or not that which is applicable to the unsettled children situation in Bristol, England, is also applicable to Main Street, U. S. A. However, many of Dr. Stott's statements are applicable no matter where the location of the family; e. g., "a family is a good one when the child can take its permanency and its membership for granted."

The book, in general, is a guide to those major weaknesses and mistakes which produce maladjustments, delinquency and other forms of unsettledness in children. The author contends that in the bringing up of children, parents have in the main to be guided by their natural affections but that circumstances sometimes get the better of even the well-intentioned. It is the responsibility, the author believes, of social workers, parents and all whose work or interests brings them into contact with unsettled children to equip themselves with a knowledge of its causes. Dr. Stott's book, in general, fulfills this need.

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